IN THE CLAIMS:

Please cancel claims 5 and 22 without prejudice as to the subject matter contained therein.

Please amend the claims as shown below in the listing of claims.

1.   (Currently amended) A method of operating a data processing system, comprising: receiving a plurality of data segments; for each of the plurality of data segments, generating an error correction code (ECC) corresponding to the data segment, said ECC providing at least one-bit error correction capability; and calculating an extended parity segment from the plurality of data segments and the corresponding ECCs, said extended parity segment comprising a parity segment calculated from the plurality of data segments and a parity ECC calculated from the corresponding ECCs; wherein said calculating the extended parity segment from the plurality of data segments and the corresponding ECCs includes: performing a first exclusive-or (XOR) calculation on an extended parity segment and a first extended data segment to produce an updated extended parity segment, said first extended data segment comprising a first data segment in the plurality of data segments and the corresponding ECC; and performing additional XOR calculations on the updated extended parity segment and additional extended data segments, each additional XOR calculation producing an updated extended parity segment, said additional extended data segments each comprising one of the plurality of data segments and the corresponding ECC.

2.   (Original) The method of claim 1, further comprising, for each of the plurality of data segments: recalculating a new ECC corresponding to the data segment; comparing the new ECC with the original ECC for the corresponding data segment; and if the new ECC does not match with the original ECC for the corresponding data segment, then restoring the corresponding data segment based on the original ECC.

3.   (Original) The method of claim 2, wherein, for each of the plurality of data segments: said generating the ECC corresponding to the data segment comprises utilizing a modified Hamming code to generate the ECC; said comparing the new ECC with the original ECC for the corresponding data segment produces an ECC syndrome; and said restoring the corresponding data segment based on the original ECC comprises restoring the corresponding data segment using the ECC syndrome.

4.   (Original) The method of claim 2, further comprising, for each of the plurality of data segments: if the new ECC does not match with the original ECC for the corresponding data segment and the data segment cannot be restored based on the original ECC, then generating a signal indicating a data integrity error.

5.   (Cancelled)

6.   (Currently amended) The method of claim [5] 1, wherein: said calculating the extended parity segment from the plurality of data segments and the corresponding ECCs further comprises storing the updated extended parity segment in an accumulator.

7.   (Original) The method of claim 1, further comprising: transmitting each of the plurality of data segments and the parity segment to a non-volatile storage device.

8.   (Original) The method of claim 1, further comprising: generating a write request from a host computer, said write request including a unit of data to be stored; and dividing the unit of data into a plurality of stripe sub-units; wherein each of said plurality of data segments comprises a portion of one of the plurality of stripe sub-units.

9.   (Original) The method of claim 1, further comprising: using the parity segment to calculate a new parity ECC; comparing the new parity ECC with the parity ECC contained within the extended parity segment; and if the new parity ECC does not match with the parity ECC contained within the extended parity segment, then restoring the parity segment based on the parity ECC contained within the extended parity segment.

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10.   (Currently amended) A data processing system, comprising: a first <u>data</u> interface for receiving data segments; an error correction code (ECC) generator connected to the first <u>data</u> interface for generating an ECC corresponding to each of the data segments received by the first <u>data</u> interface, said ECC providing at least one-bit error correction capability, each of the data segments and the corresponding ECC forming an extended data segment; an exclusive-or (XOR) module connected to the ECC generator for performing XOR calculations on the extended data segments to generate [a] <u>an</u> extended parity segment, said extended parity segment comprising a parity segment and a parity ECC; and an ECC check module connected to the XOR module for recalculating a new ECC for each extended data segment and comparing the new ECC to the original ECC corresponding to that extended data segment, wherein for each extended data segment, if the new ECC does not match with the original ECC, said ECC check module is configured to restore the data segment using the original ECC.

11.   (Original) The system of claim 10, wherein: said XOR module comprises: an XOR circuit for performing an XOR calculation on the extended parity segment and another extended data segment; and an accumulator for storing the extended parity segment.

12.   (Original) The system of claim 10, further comprising: a buffer cache connected to the ECC generator and to the XOR module for storing the extended data segments from the ECC generator.

13.   (Original) The system of claim 10, wherein: said ECC generator utilizes a modified Hamming code to generate each ECC.

14.   (Original) The system of claim 12, wherein: said ECC check module is configured to compare the new ECC to the original ECC by generating an ECC syndrome, and if the ECC indicates a correctable error, the ECC check module is further configured to restore the data segment using the ECC syndrome.

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15.   (Original) The system of claim 10, wherein: said ECC check module is configured such that for each extended data segment, if the new ECC does not match with the original ECC and the original ECC cannot be used to restore the data segment, the ECC check module generates a signal indicating a data integrity error.

16.   (Original) The system of claim 10, further comprising: at least one storage device; a controller bus connected to the first data interface; a front end interface connected to the controller bus for receiving the data segments and passing the data segments to the first data interface via the controller bus; and a back end interface connected to the controller bus and the at least one storage device, said back end interface for receiving the data segments from the first data interface via the controller bus and passing the data segments to the at least one storage device.

17.   (Original) The system of claim 16, further comprising: a host/storage connection connected to the front end interface; and a host system connected to the host/storage connection, said host system for transmitting write requests, each of the data segments containing data from one of the write requests.

18.   (Currently amended) An article of manufacture comprising a computer readable medium including code for operating a data processing system, wherein the code causes operations to be performed comprising: receiving a plurality of data segments; for each of the plurality of data segments, generating an error correction code (ECC) corresponding to the data segment, said ECC providing at least one-bit error correction capability; and calculating an extended parity segment from the plurality of data segments and the corresponding ECCs, said extended parity segment comprising a parity segment calculated from the plurality of data segments and a parity ECC calculated from the corresponding ECCs; wherein said calculating the extended parity segment from the plurality of data segments and the corresponding ECCs comprises: performing a first exclusive-or (XOR) calculation on a extended parity segment and a first extended data segment to produce an updated extended parity segment, said first extended data segment

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comprising a first data segment in the plurality of data segments and the corresponding ECC; and performing additional XOR calculations on the updated extended parity segment and additional extended data segments, each additional XOR calculation producing an updated extended parity segment, said additional extended data segments each comprising one of the plurality of data segments and the corresponding ECC.

19.   (Currently amended) The article of manufacture of claim 18, further comprising code causing operations to be performed comprising: for each of the plurality of data segments: recalculating a new ECC corresponding to the data segment; comparing the new ECC with the original ECC for the corresponding data segment; and if the new ECC does not match with the original ECC for the corresponding data segment, then restoring the corresponding data segment based on the original ECC.

20.   (Original) The article of manufacture of claim 19, wherein: for each of the plurality of data segments: said generating the ECC corresponding to the data segment comprises utilizing a modified Hamming code to generate the ECC; said comparing the new ECC with the original ECC for the corresponding data segment produces an ECC syndrome; and said restoring the corresponding data segment based on the original ECC comprises restoring the corresponding data segment using the ECC syndrome.

21.   (Currently amended) The article of manufacture of claim 19, further comprising code causing operations to be performed comprising: for each of the plurality of data segments, if the new ECC does not match with the original ECC for the corresponding data segment and the data segment cannot be restored based on the original ECC, then generating a signal indicating a data integrity error.

22.   (Cancelled)

23.   (Currently amended) The article of manufacture of claim [22] 18, wherein: said calculating the extended parity segment from the plurality of data segments and the corresponding ECCs further comprises storing the updated extended parity segment in an

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accumulator.

24.   (Currently amended) The article of manufacture of claim 18, further comprising code causing operations to be performed comprising: transmitting each of the plurality of data segments and the parity segment to a non-volatile storage device.

25.   (Currently amended) The article of manufacture of claim 18, further comprising code causing operations to be performed comprising: generating a write request from a host computer, said write request including a unit of data to be stored; and dividing the unit of data into a plurality of stripe sub-units; wherein each of said plurality of data segments comprises a portion of one of the plurality of stripe sub-units.

26.   (Currently amended) The article of manufacture of claim 18, further comprising code causing operations to be performed comprising: using the parity segment to calculate a new parity ECC; comparing the new parity ECC with the parity ECC contained within the extended parity segment; and if the new parity ECC does not match with the parity ECC contained within the extended parity segment, then restoring the parity segment based on the parity ECC contained within the extended parity segment.

27.   (Currently amended) A storage system, comprising: a front end interface for receiving [the] data segments; a controller bus connected to the ~~first data~~ front end interface; at least one storage device; a back end interface connected to the controller bus and the at least one storage device, said back end interface for receiving the data segments from the first data interface via the controller bus and passing the data segments to the at least one storage device[.]; a ~~first~~ controller interface connected to the controller bus for receiving data segments; an error correction code (ECC) generator connected to the ~~first~~ controller interface for generating an ECC corresponding to each of the data segments received by the ~~first~~ controller interface, said ECC providing at least one-bit error correction capability, each of the data segments and the corresponding ECC forming an extended data segment; an exclusive-or (XOR) module connected to the ECC generator for performing XOR calculations on the extended data segments to generate [a]

an extended parity segment, said extended parity segment comprising a parity segment and a parity ECC; and an ECC check module connected to the XOR module for recalculating a new ECC for each extended data segment and comparing the new ECC to the original ECC corresponding to that extended data segment, wherein for each extended data segment, if the new ECC does not match with the original ECC, said ECC check module is configured to restore the data segment using the original ECC.

28.   (Original) The system of claim 27, wherein: said XOR module comprises: an XOR circuit for performing an XOR calculation on the extended parity segment and another extended data segment; and an accumulator for storing the extended parity segment.

29.   (Original) The system of claim 27, further comprising: a buffer cache connected to the ECC generator and to the XOR module for storing the extended data segments from the ECC generator.

30.   (Original) The system of claim 27, wherein: said ECC generator utilizes a modified Hamming code to generate each ECC.

31.   (Original) The system of claim 29, wherein: said ECC check module is configured to compare the new ECC to the original ECC by generating an ECC syndrome, and if the ECC indicates a correctable error, the ECC check module is further configured to restore the data segment using the ECC syndrome.

32.   (Original) The system of claim 27, wherein: said ECC check module is configured such that for each extended data segment, if the new ECC does not match with the original ECC and the original ECC cannot be used to restore the data segment, the ECC check module generates a signal indicating a data integrity error.